REMARKS

In the Office Action the Examiner noted that claims 1-44 are pending in the application, and the Examiner rejected all claims. The Examiner's rejections are traversed below, and reconsideration of all rejected claims is respectfully requested.

Rejection of Claims Under 35 USC §103

In items 1-4 on pages 2-4 of the Office Action the Examiner rejected claims 1-44 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,172,816, issued to Tadic-Galeb et al. (hereinafter referred to as "Tadic-Galeb"), in view of U.S. Patent 5,101,458, issued to Spaulding et al. (hereinafter referred to as "Spaulding").

Claim 1 of the present application recites:

> An illumination optical system comprising:
> a light source which emits light; and
> a light separation/integration device including a diffraction device which is provided on at least one incident side of the light separation/integration device, wherein the diffraction device diffracts the light to adjust an incident angle thereof to a predetermined range.

Therefore, the diffraction device provided on the light separation/integration device "diffracts the light to adjust an incident angle thereof to a predetermined range."

The Examiner states that Tadic-Galeb "is silent with respect to a diffraction device that is provided on at least one incident side of the light separation/integration device wherein the diffraction device diffracts light to adjust an incident angle thereof to a predetermined range." The Examiner goes on to state that Spaulding discloses "the use of a diffraction device which is provided on at least one incident side of a light separation/integration device (Fig. 1) wherein the diffraction device diffracts light to adjust an incident angle thereof to a predetermined range." The Applicant respectfully disagrees with the Examiner's assertion regarding Spaulding.

Spaulding discloses a hybrid prism/grating coupler to couple light into and out of an optical waveguide of an integrated optical circuit while compensating for dispersion of the light caused by variations in wavelength of the light (Abstract). Spaulding "provides couplers with achromatic coupling angle properties over a wide wavelength range so as to enable laser diodes" to be used in the optical circuits (Column 1, Lines 49-53). The diffractive element "defines with the prism a condition for achromatic coupling where angular dispersion of the light is eliminated with variations in wavelength of the light over a range of interest sufficient to cover

wavelength variations due to mode hopping and like in laser diodes" (Column 2, Lines 30-39).

This is in contrast to claim 1 of the present application, in which the diffraction device provided on the light separation/integration device "diffracts the light to adjust an incident angle thereof to a predetermined range," so that the light incident on the separation/integration device is at an incident angle which maximizes light efficiency. This decreases a light loss and increases the efficiency of the light output to a device such as an optical system and a projection optical system. Therefore, unlike Spaulding, in which the hybrid prism/grating coupler is used for wavelength shift compensation (Column 3, Lines 44-46) by correcting the light dispersion of the prism coupler (Column 4, Lines 3-6), the diffraction device in claim 1 diffracts the light to improve the angle of the incident light beam on the light separation/integration device.

Therefore, Spaulding does not disclose "a light separation/integration device including a diffraction device which is provided on at least one incident side of the light separation/integration device, wherein the diffraction device diffracts the light to adjust an incident angle thereof to a predetermined range." Further, this deficiency in Spaulding is not cured by Tadic-Galeb. Therefore, it is respectfully submitted that claim 1 patentably distinguishes over the cited references, and withdrawal of the §103(a) rejection is respectfully requested.

Claims 2-14, 32-36, and 44 depend from claim 1 and include all of the features of that claim plus additional features which are not taught or suggested by the cited references. Therefore, it is respectfully submitted that claims 2-14, 32-36, and 44 also patentably distinguish overt the cited references.

Claim 15 of the present application recites "a light separation/integration device which includes a diffraction device provided on at least one incident side thereof, wherein the diffraction device diffracts the light to adjust an incident angle thereof to a predetermined range." Therefore, it is respectfully submitted that claim 15 also patentably distinguishes over the cited references.

Claims 16-31 and 37-41 depend from claim 15 and include all of the features of that claim plus additional features which are not taught or suggested by the cited references. Therefore, it is respectfully submitted that claims 16-31 and 37-41 also patentably distinguish overt the cited references.

Claim 42 of the present application recites "a light separation/integration device including diffraction devices which are provided on incident sides of the light separation/integration device corresponding to the lights, wherein each of the diffraction devices diffracts the corresponding

light to adjust an incident angle thereof to a predetermined range." Therefore, it is respectfully submitted that claim 42 also patentably distinguishes over the cited references.

Claim 43 depends from claim 42 and includes all of the features of that claim plus additional features which are not taught or suggested by the cited references. Therefore, it is respectfully submitted that claim 43 also patentably distinguishes over the cited references.

No Motivation To Combine the Cited References

Even if the two cited references did disclose all of the features of the present invention, and the Applicant respectfully submits that they do not, there is no motivation to combine the two references in an attempt to obtain the features of the present invention. The disclosure of Tadic-Galeb relates to projection lenses and projection systems that improve use of total light energy emitted by an illumination system, and the disclosure of Spaulding relates to achromatic input/output couplers for optical integrated circuits. To set forth a prima facie §103 rejection, there must be some evidenced reason for modifying a reference. Specifically, there must be evidence, outside of the present application, which motivates, leads, or suggests to one of ordinary skill to modify a reference (MPEP 2141). The Applicant respectfully submits that there is no motivation to combine the disclosure of Spaulding regarding optical integrated circuits with the disclosure of Tadic-Galeb regarding projection lenses and projection systems. Among the many differences in the two fields represented by Tadic-Galeb and Spaulding are the very different uses of light, as well as the vastly different scales of size in which the components operate.

MPEP § 2142 states that "[w]hen the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the Examiner to explain why the combination of the teachings is proper." Here, the Examiner has simply stated, with no evidence to support the assertion, that the "motivation for such an improvement would be to correct any unwanted dispersion of the prism and reduce the size of the optical package." However, the Examiner is simply repeating an observation disclosed in Spaulding, in Lines 3-10 of Column 4, regarding applying the grating to the output surface of the prism. The Applicant respectfully submits that this does not speak to the motivation for combining the two references. The Examiner is required to present actual evidence and make particular findings related to the motivation to combine the teachings of the references. In re Kotzab, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."

Dembiczak, 50 USPQ2d at 1617. "'The factual inquiry whether to combine the references must be thorough and searching.'" In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) (citing McGinley v. Franklin Sports, Inc., 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)). The factual inquiry must be based on objective evidence of record, and cannot be based on subjective belief and unknown authority. Id. at 1433-34. The Examiner must explain the reasons that one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious. In re Rouffet, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998).

Therefore, for at least the reasons presented above, the Applicant respectfully submits that there is no motivation to combine the references cited by the Examiner.

Summary

Claims 1-44 are pending and under consideration. It is respectfully submitted that none of the references wither taken alone or in combination disclose the present claimed invention. There being no further outstanding objections or rejections, it is respectfully submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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